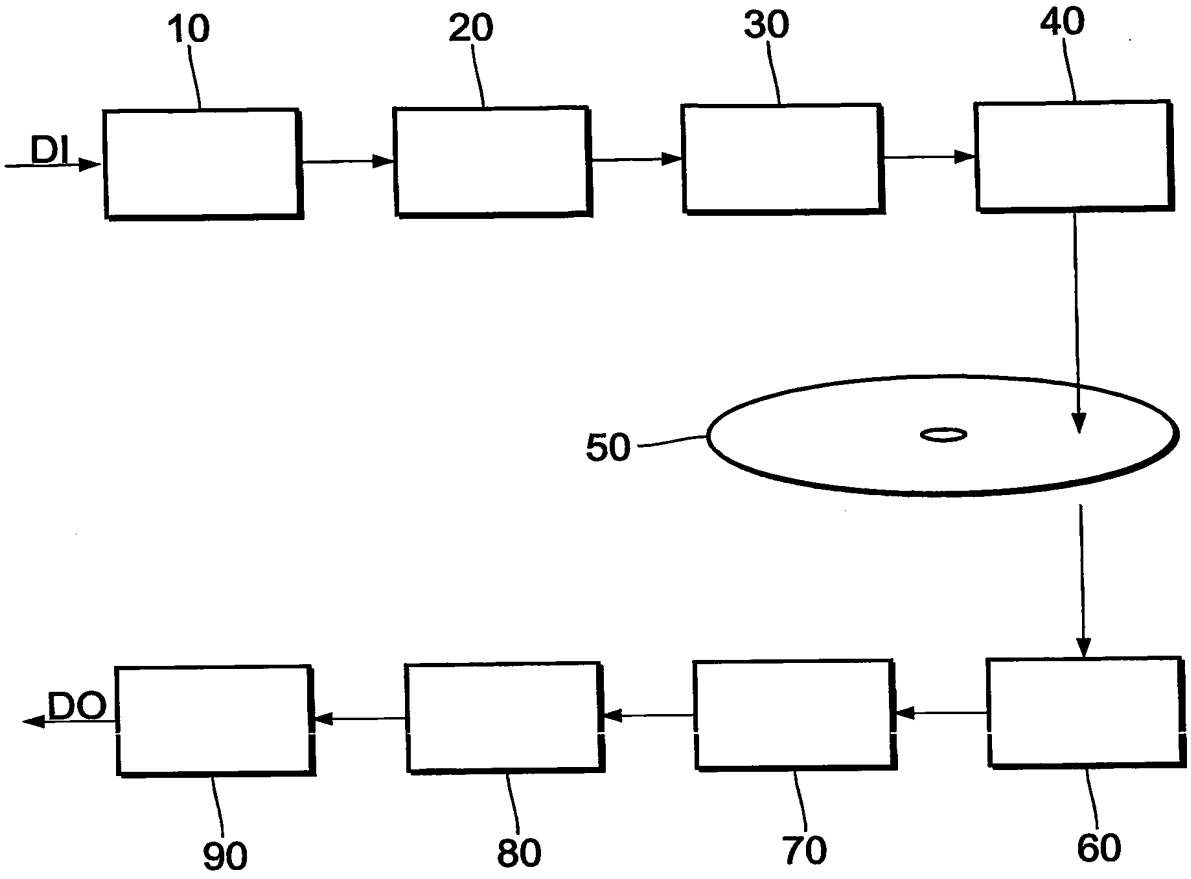


FIG.1

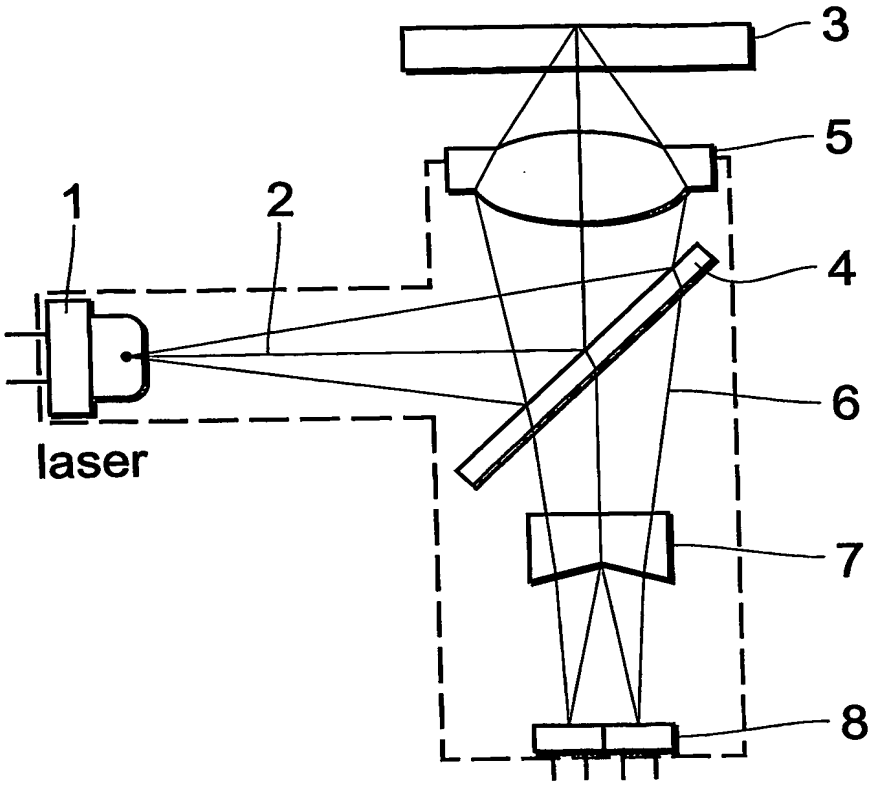

3
5
1
2
4
6
laser
7
8

FIG.2

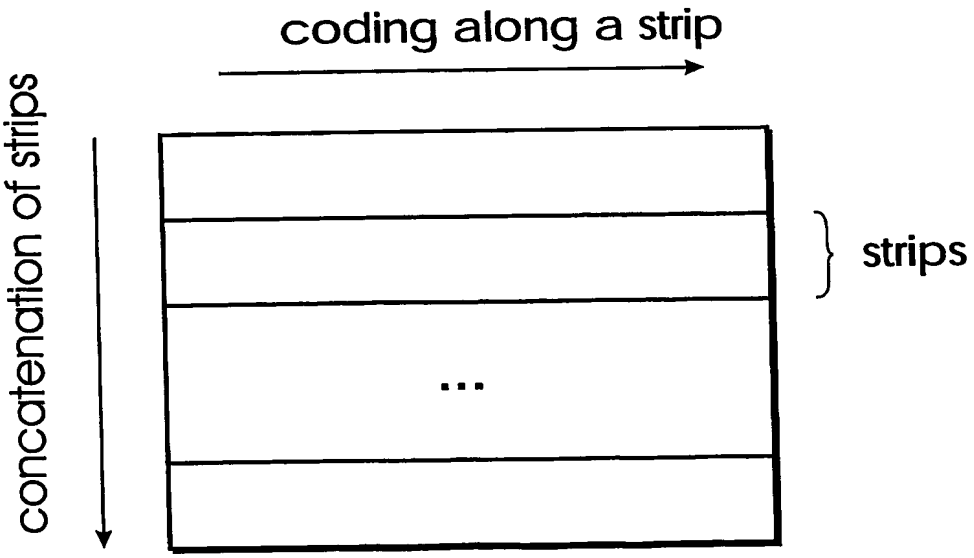

coding along a strip
concatenation of strips
strips
...

FIG.3

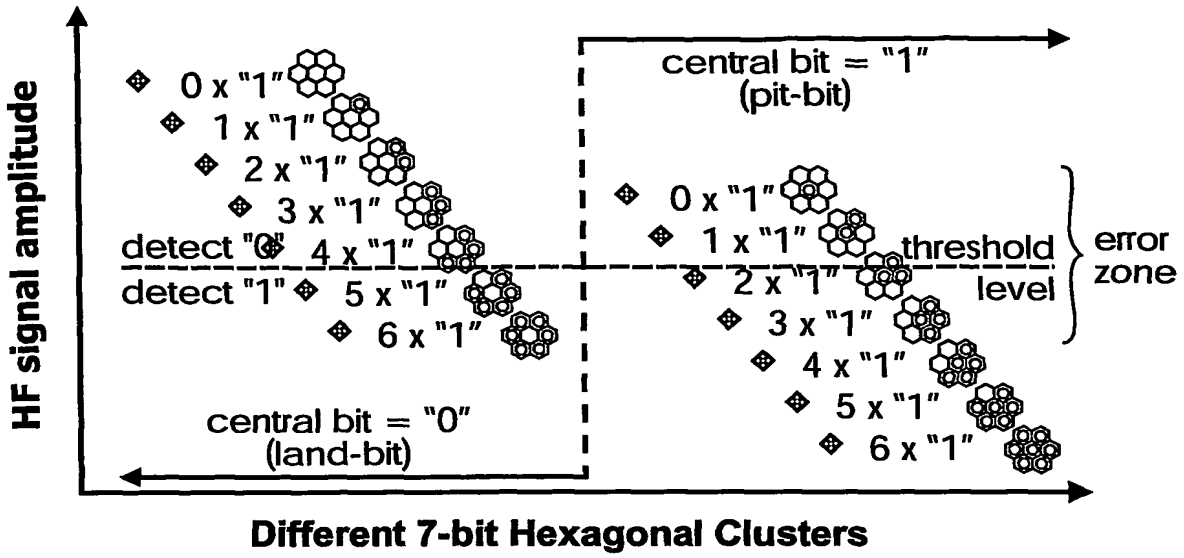
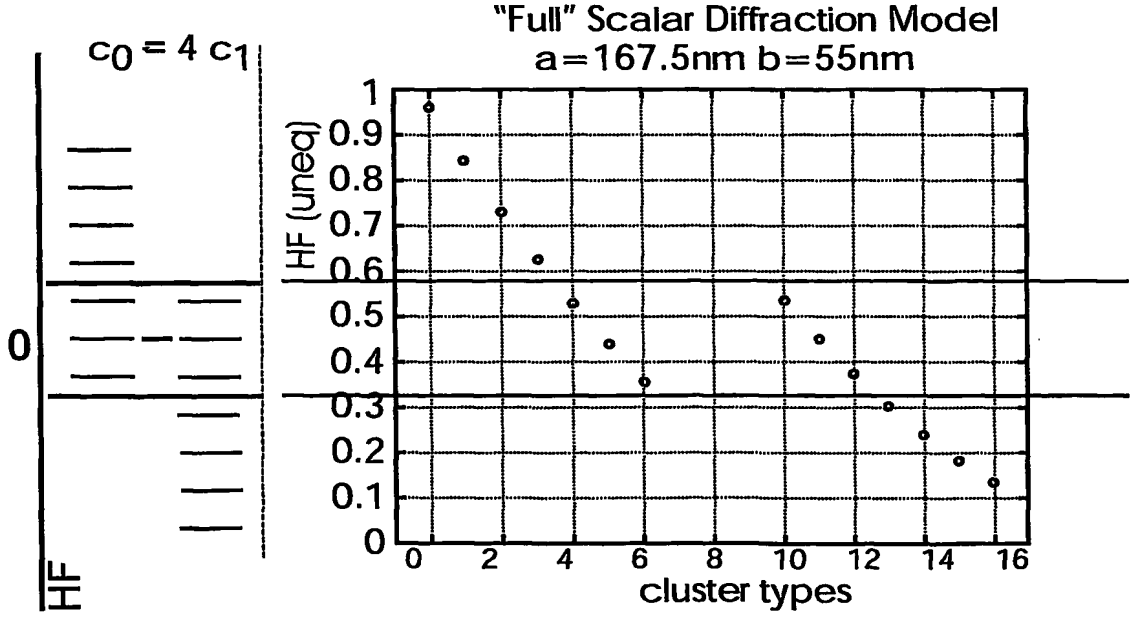


FIG.4



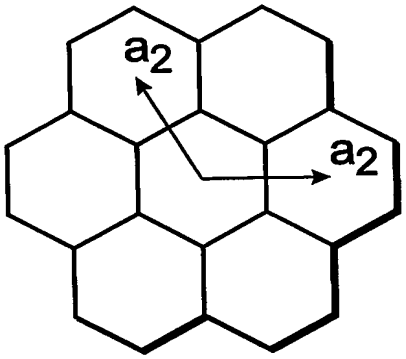
$a_{Hex\text{-}2D}$ = 167.5 nm S_{2D} <user bit> = 0.4281 [λ / (2NA)]^2

S_{DVR} <user bit> = 0.6343 [λ / (2NA)]^2

x 1.48

x 11/12 = 1.36

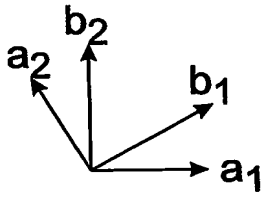
FIG.5



$a_1 = [10]$ $|a_1| = 1$

$a_2 = [01]$ $|a_2| = 1$

FIG.6a



$a_i \cdot b_i = \delta_{i,j}$

$|b_1| = |b_2| = 1.155$

FIG.6b

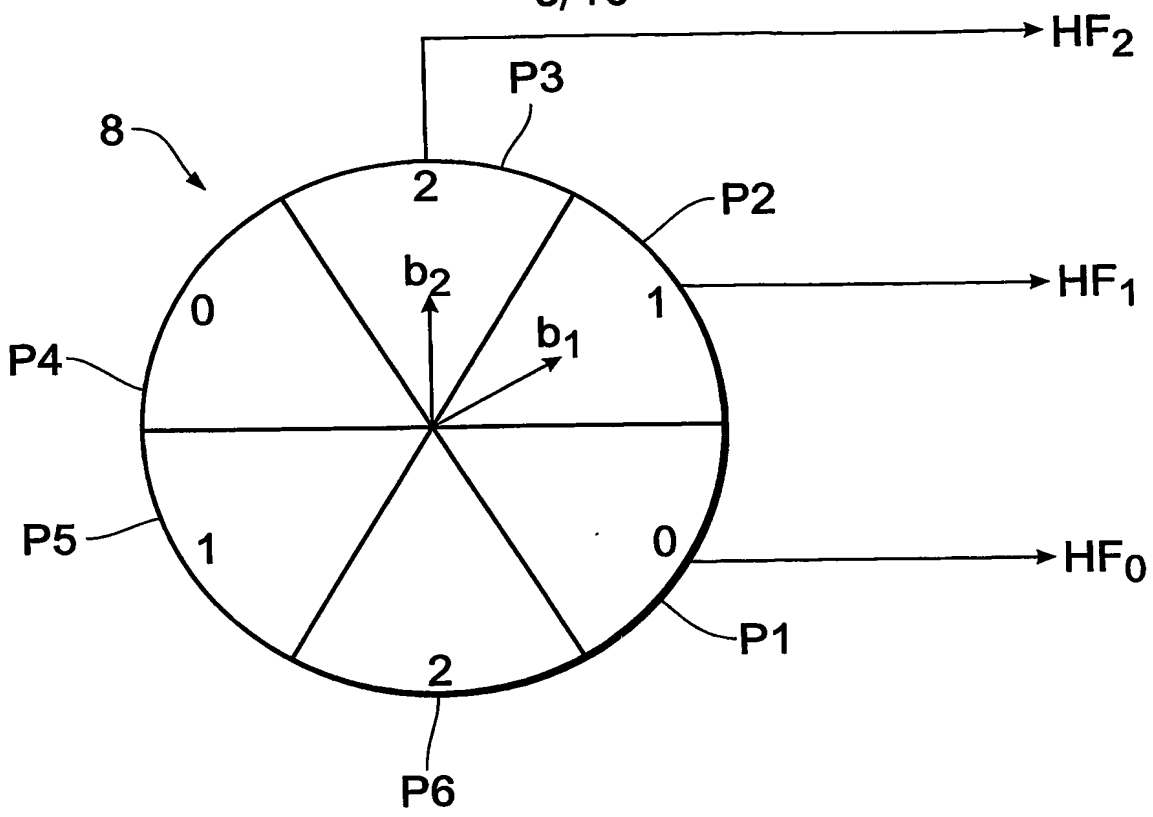
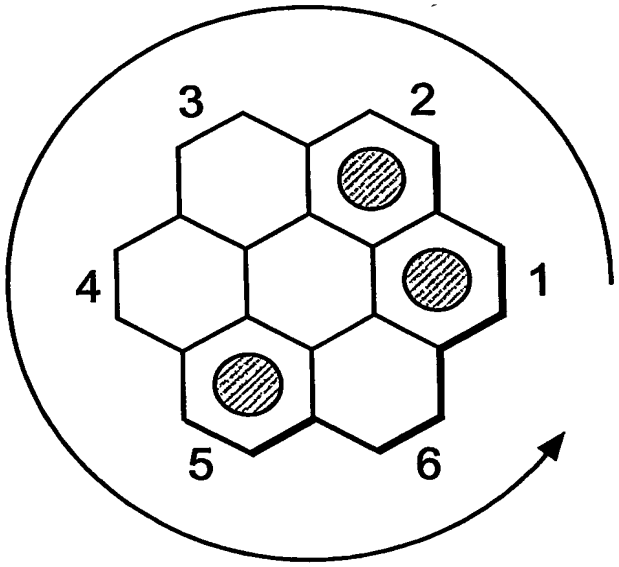


FIG.7



[1 1 0 0 1 0]

FIG.8

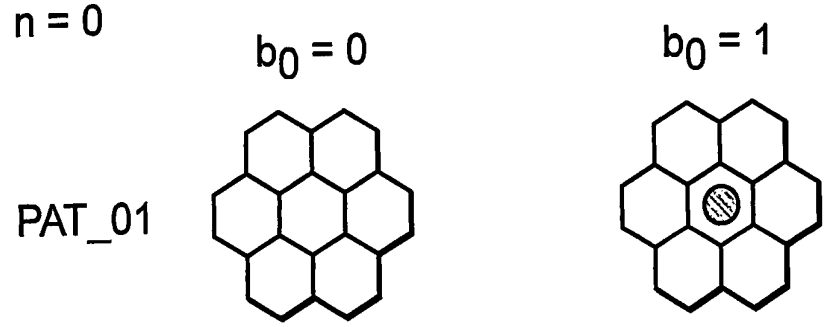

n = 0
$b_0 = 0$
$b_0 = 1$
PAT_01
rotation multiplicity
inversion multiplicity
x1
x1
[0 0 0 0 0 0]
total nr of patterns = 1

FIG.9

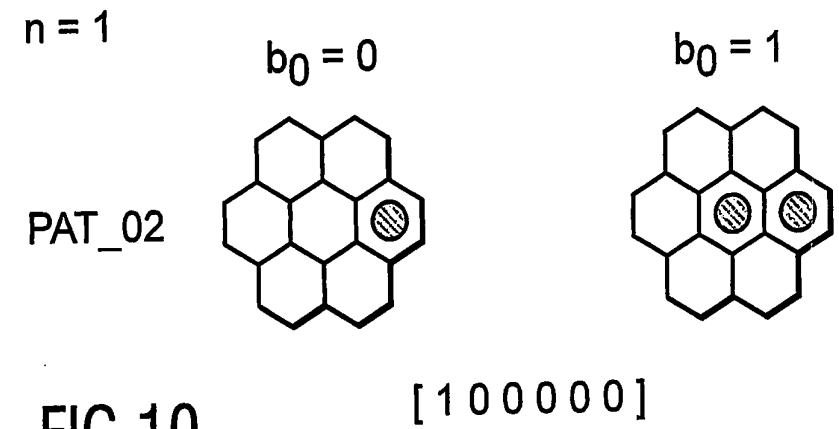

n = 1
$b_0 = 0$
$b_0 = 1$
PAT_02
x3
x2
[1 0 0 0 0 0]
total nr of patterns = 6

FIG.10

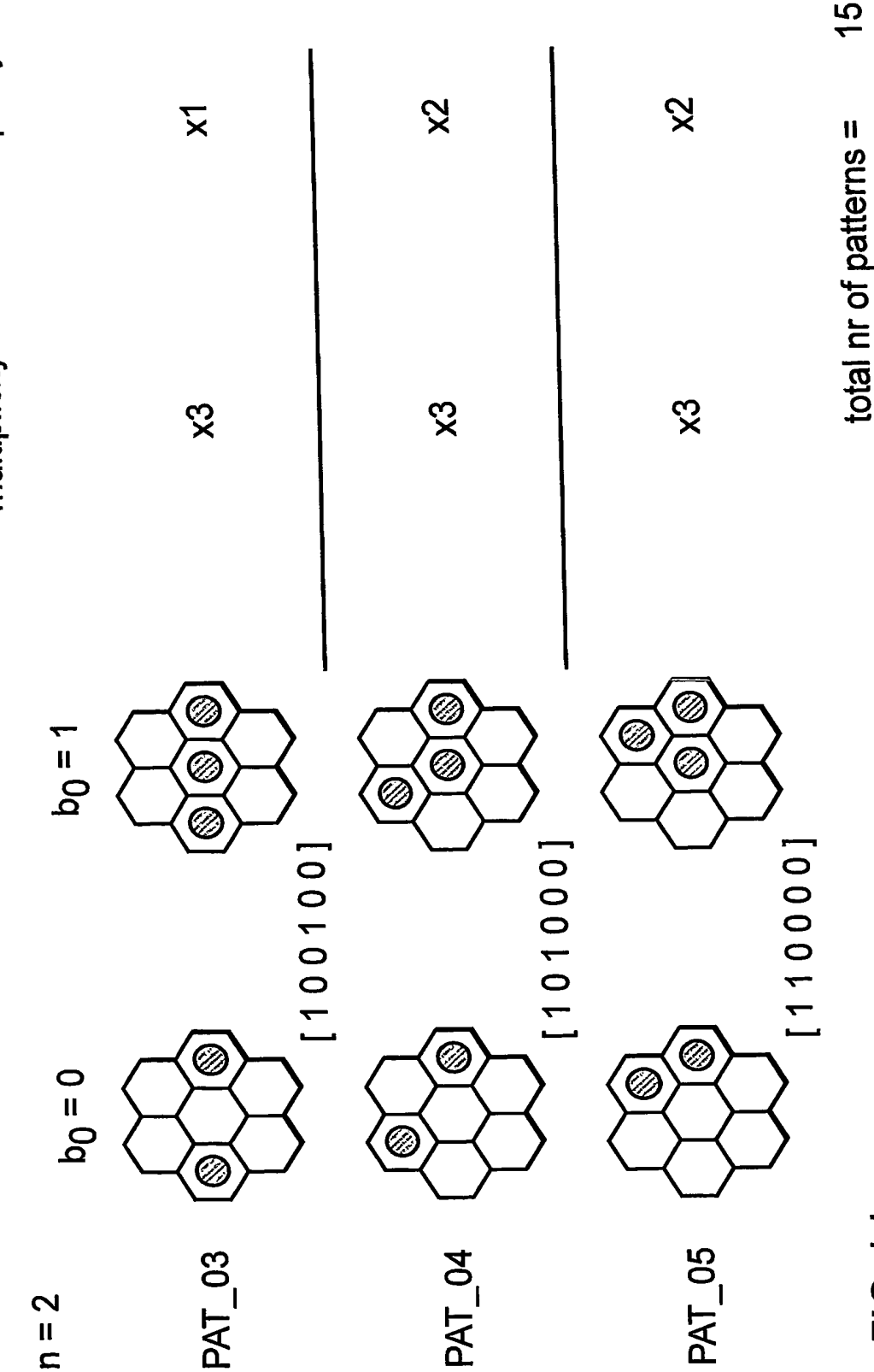

n = 2
b0 = 0
b0 = 1
rotation multiplicity
inversion multiplicity
PAT_03
[1 0 0 1 0 0 0]
x3
x1
PAT_04
[1 0 1 0 0 0 0]
x3
x2
PAT_05
[1 1 0 0 0 0 0]
x3
x2
total nr of patterns = 15

FIG.11

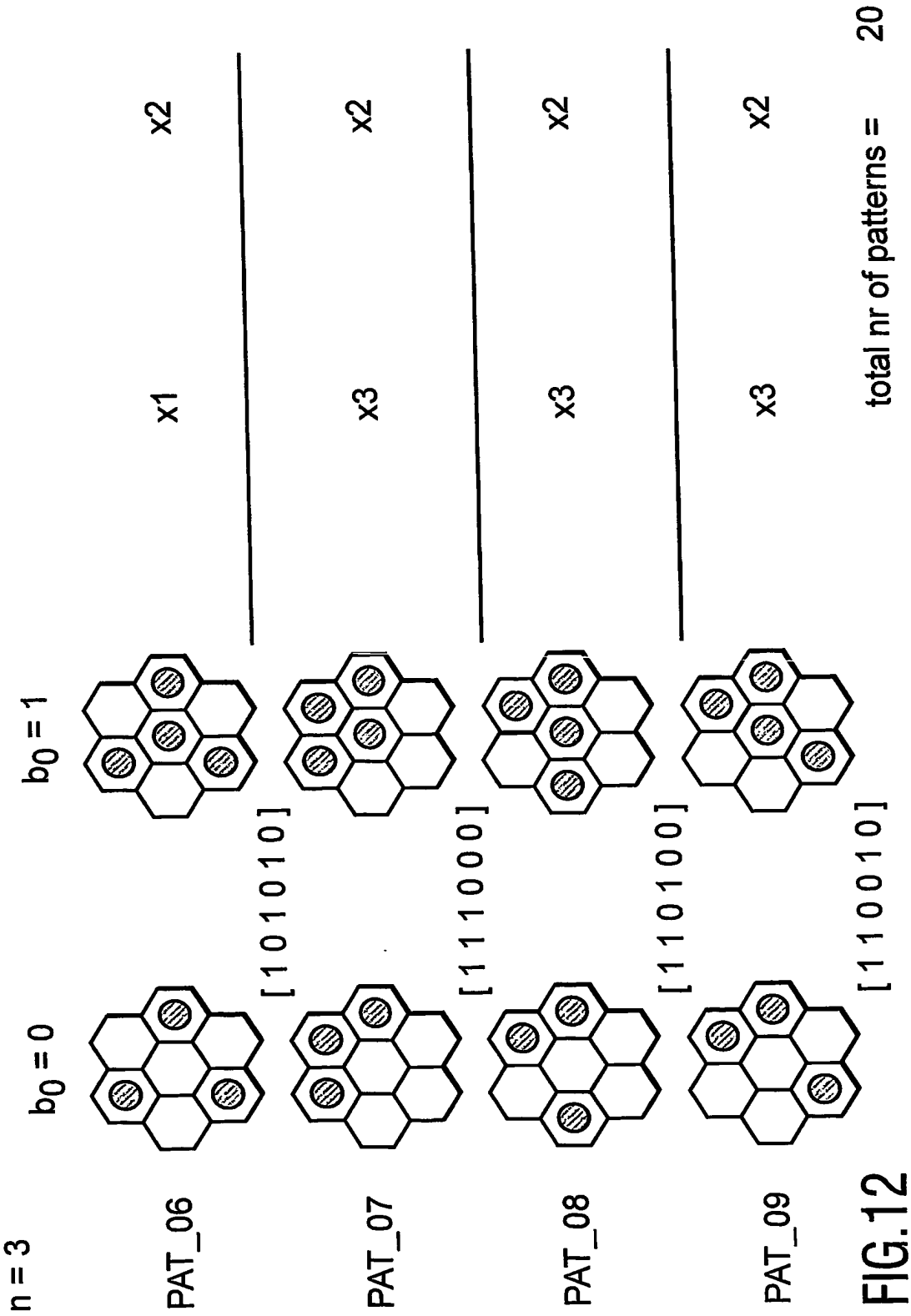

n = 3
b0 = 0
b0 = 1
rotation multiplicity
inversion multiplicity
PAT_06
[1010100]
x1
x2
PAT_07
[1110000]
x3
x2
PAT_08
[1101000]
x3
x2
PAT_09
[1100100]
x3
x2
total nr of patterns = 20

FIG.12

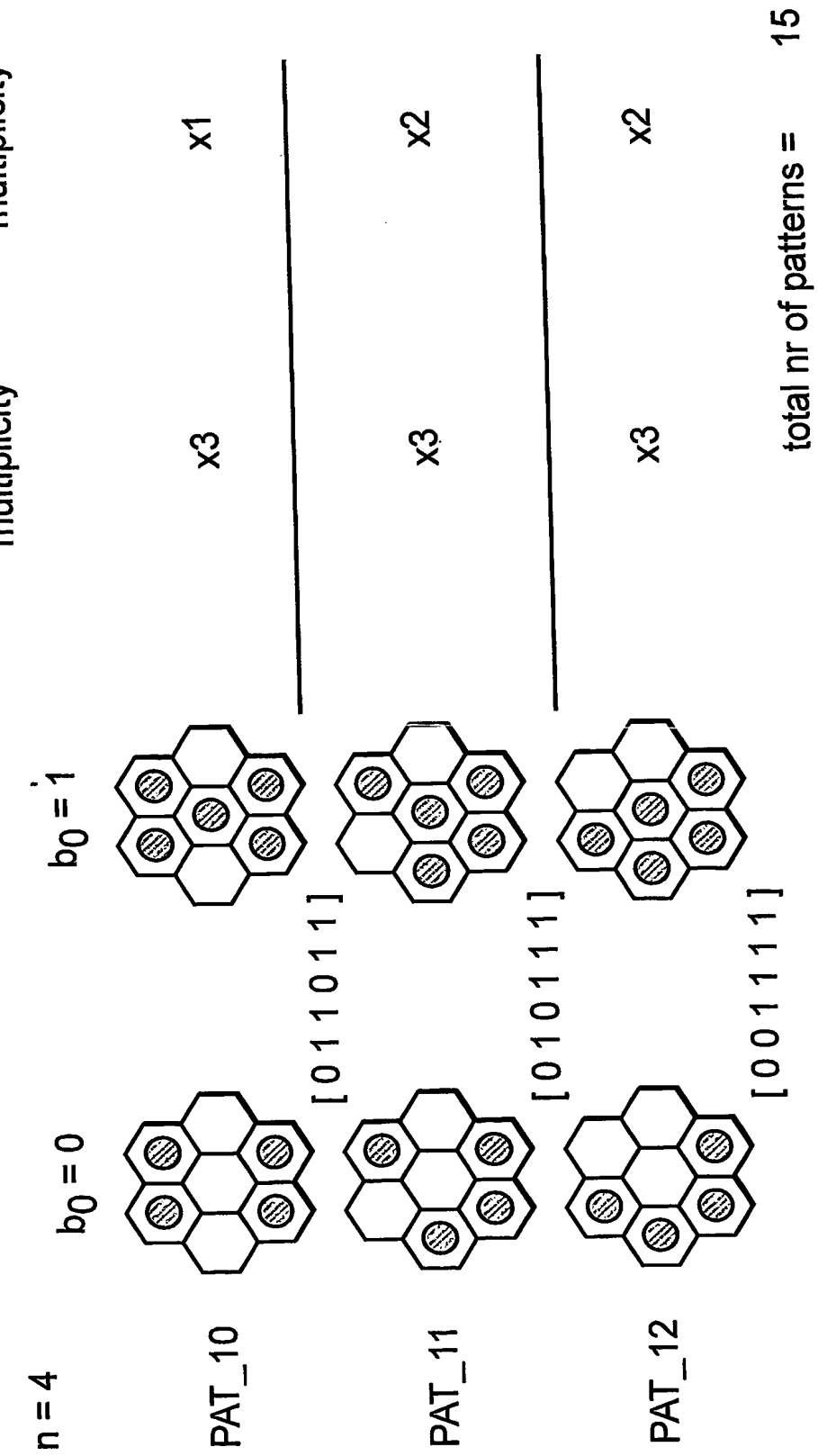

n = 4
PAT_10
PAT_11
PAT_12
b0 = 0
b0 = 1
[0 1 1 0 1 1]
[0 1 0 1 1 1]
[0 0 1 1 1 1]
rotation multiplicity
inversion multiplicity
x3
x1
x3
x2
x3
x2
total nr of patterns = 15

FIG.13

n = 5
PAT_13
b0 = 0
b0 = 1
[0 1 1 1 1 1]
rotation multiplicity
x3
inversion multiplicity
x2
total nr of patterns = 6

FIG.14

n = 6
PAT_14
b0 = 0
b0 = 1
[1 1 1 1 1 1]
rotation multiplicity
x1
inversion multiplicity
x1
total nr of patterns = 1

FIG.15

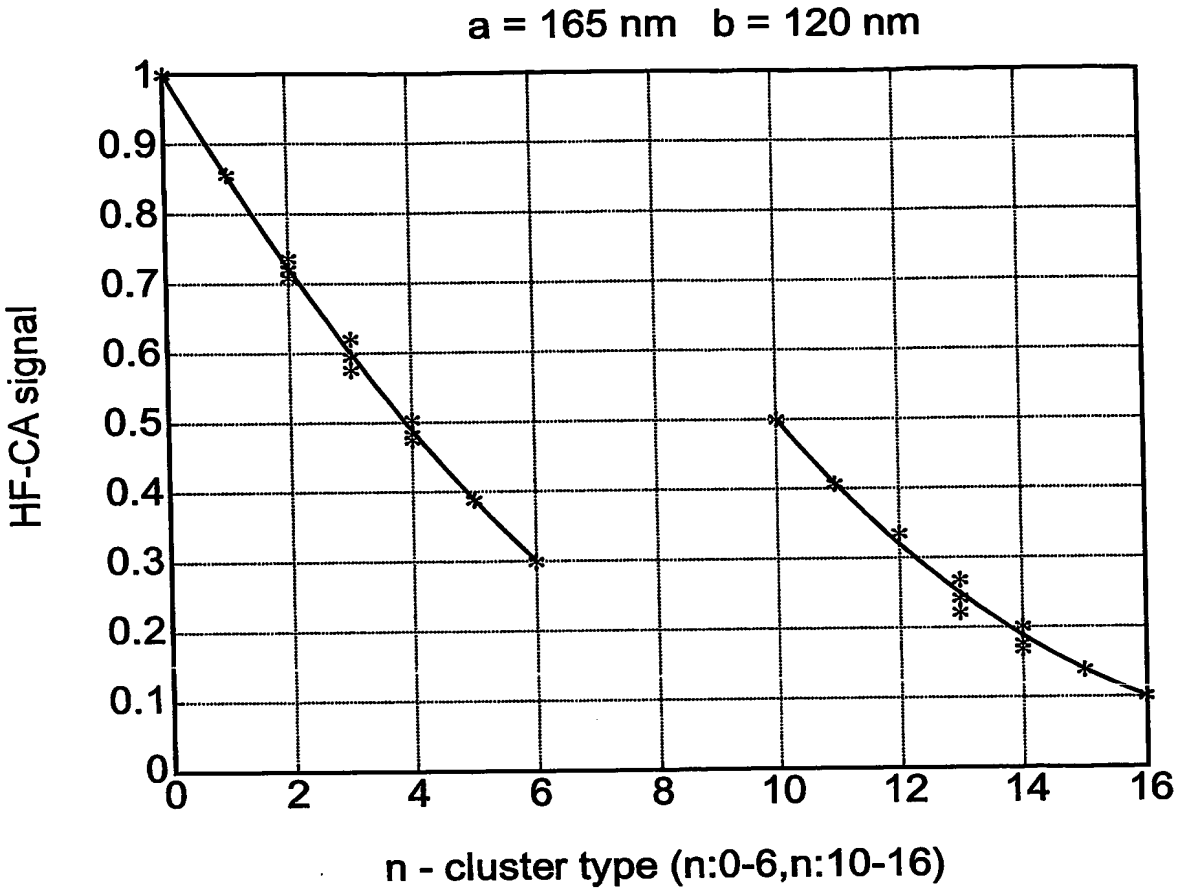
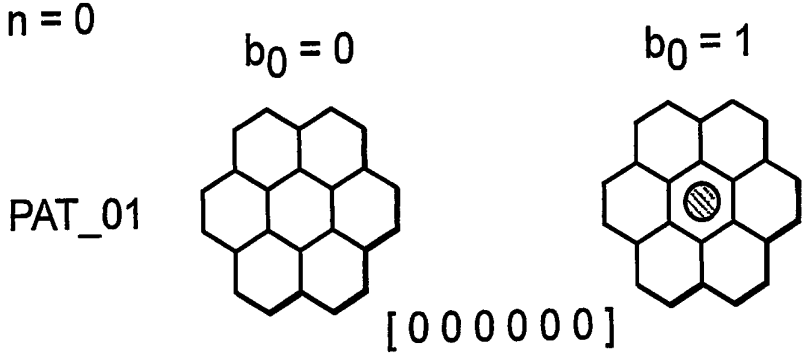

a = 165 nm b = 120 nm
HF-CA signal
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
2
4
6
8
10
12
14
16
n - cluster type (n:0-6,n:10-16)

FIG.16



CA-Signals

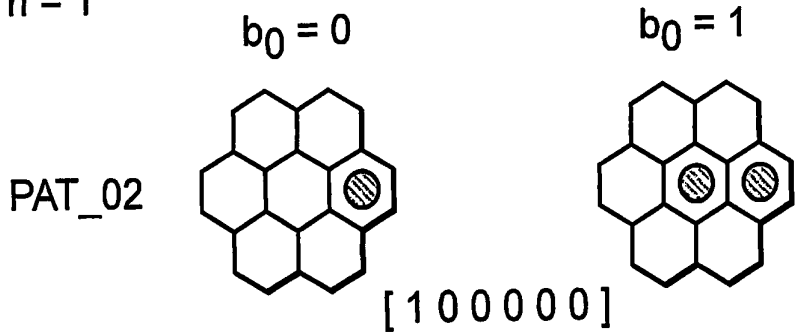
HF = { 333, 333, 333 }

HF-CA = 1000

HF = { 166, 166, 166 }

HF-CA = 499

FIG.17



HF = { 268, 268, 318 }

HF-CA = 855

HF = { 123, 123 158 }

HF-CA = 404

FIG.18

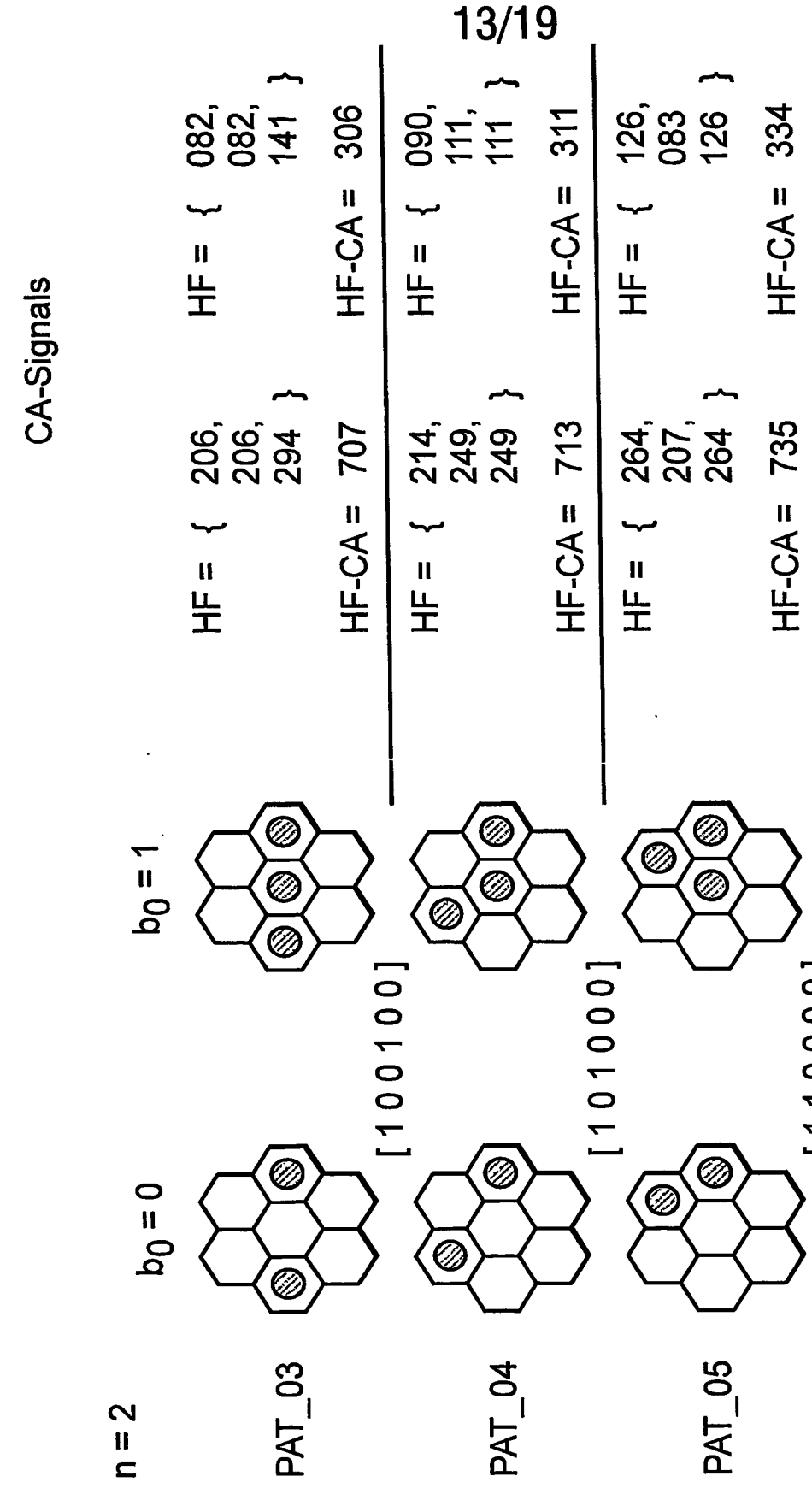

CA-Signals
n = 2
PAT_03
PAT_04
PAT_05
b0 = 0
b0 = 1
[1 0 0 1 0 0]
[1 0 1 0 0 0]
[1 1 0 0 0 0]
HF = { 206, 206, 294 }
HF-CA = 707
HF = { 082, 082, 141 }
HF-CA = 306
HF = { 214, 249, 249 }
HF-CA = 713
HF = { 090, 111, 111 }
HF-CA = 311
HF = { 264, 207, 264 }
HF-CA = 735
HF = { 126, 083 126 }
HF-CA = 334

FIG.19

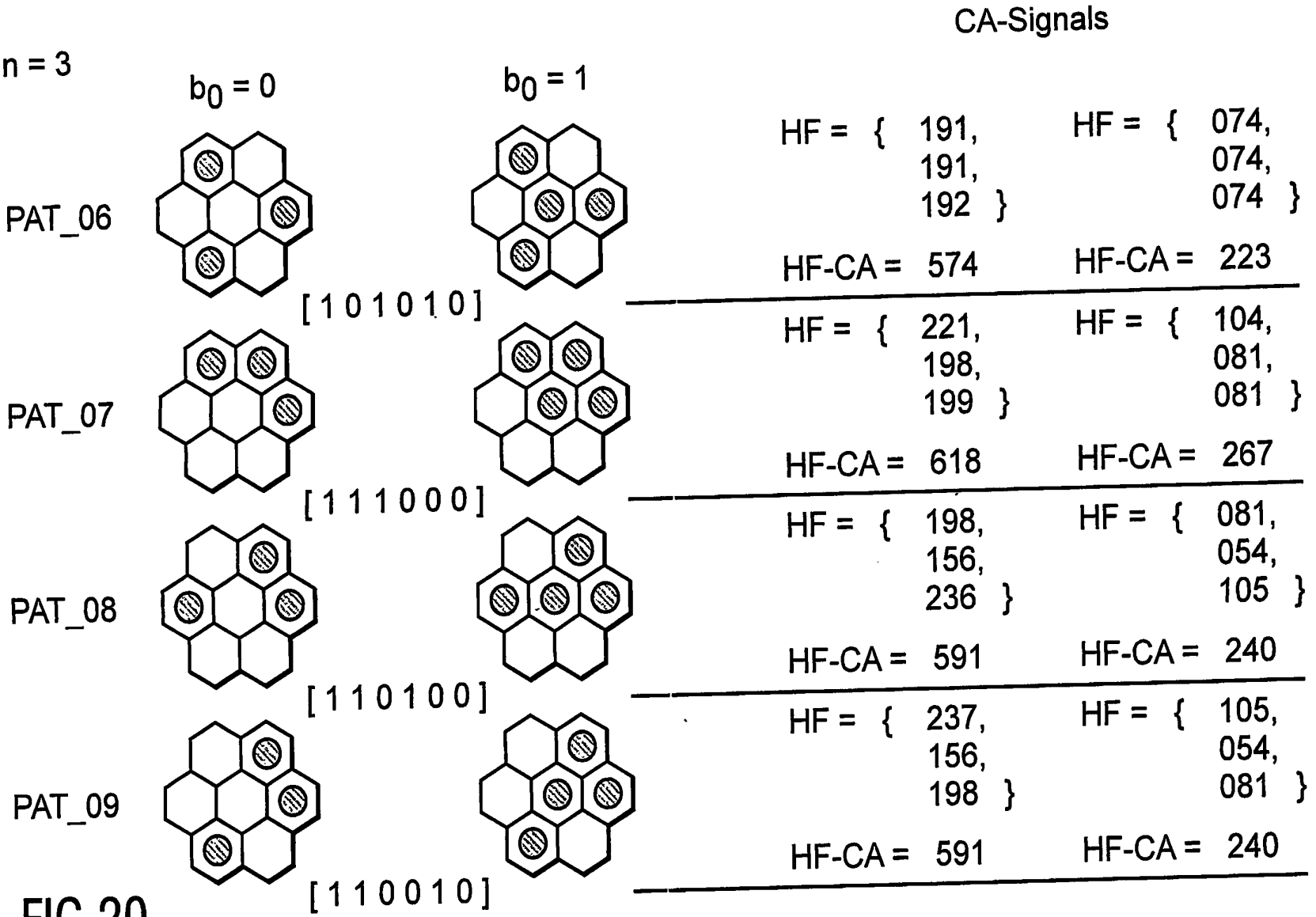

n = 3
$b_0 = 0$
$b_0 = 1$
CA-Signals
PAT_06
[1 0 1 0 1 0]
HF = { 191, 191, 192 }
HF-CA = 574
HF = { 074, 074, 074 }
HF-CA = 223
PAT_07
[1 1 1 0 0 0]
HF = { 221, 198, 199 }
HF-CA = 618
HF = { 104, 081, 081 }
HF-CA = 267
PAT_08
[1 1 0 1 0 0]
HF = { 198, 156, 236 }
HF-CA = 591
HF = { 081, 054, 105 }
HF-CA = 240
PAT_09
[1 1 0 0 1 0]
HF = { 237, 156, 198 }
HF-CA = 591
HF = { 105, 054, 081 }
HF-CA = 240

FIG.20

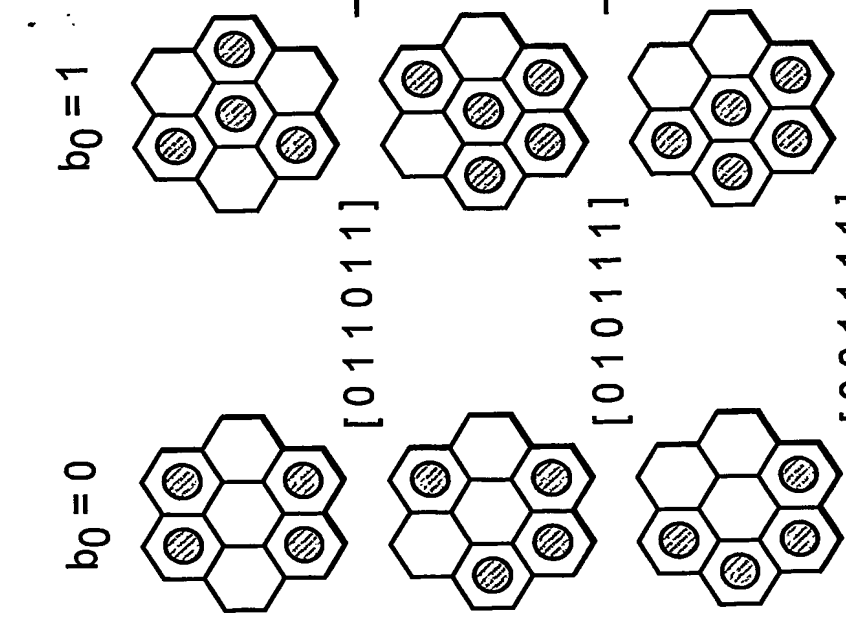
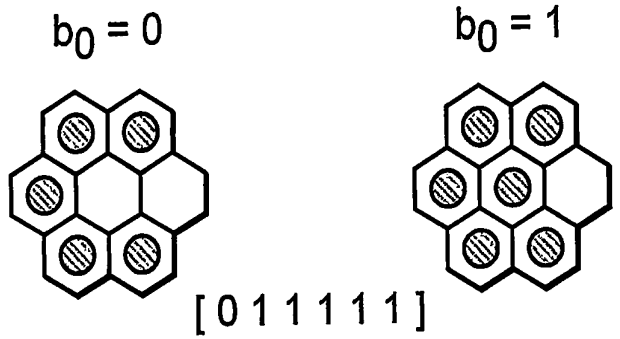

n = 4
PAT_10
PAT_11
PAT_12
b0 = 0
b0 = 1
[0 1 1 0 1 1]
[0 1 0 1 1 1]
[0 0 1 1 1 1 1]
CA-Signals
HF = { 181, 181, 110 }
HF-CA = 473
HF = { 072, 072, 029 }
HF-CA = 172
HF = { 190, 144, 144 }
HF-CA = 478
HF = { 080, 048, 049 }
HF-CA = 176
HF = { 159, 182, 160 }
HF-CA = 501
HF = { 063, 072, 064 }
HF-CA = 199

FIG.21

CA-Signals

n = 5

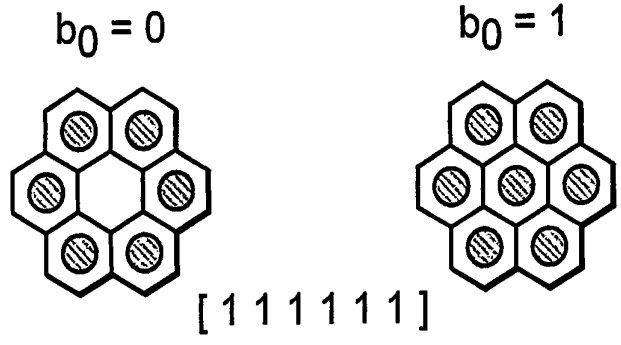


HF = { 138, 138, 109 }
HF-CA = 386

HF = { 053, 053, 034 }
HF-CA = 141

FIG.22

n = 6



HF = { 100, 100, 100 }
HF-CA = 299

HF = { 035, 035 035 }
HF-CA = 105

FIG.23

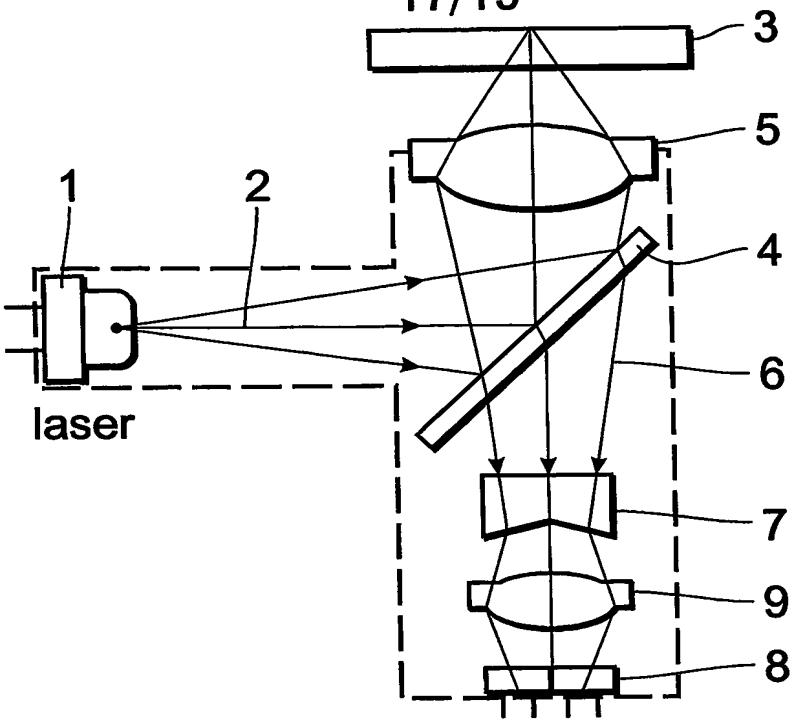


FIG.24

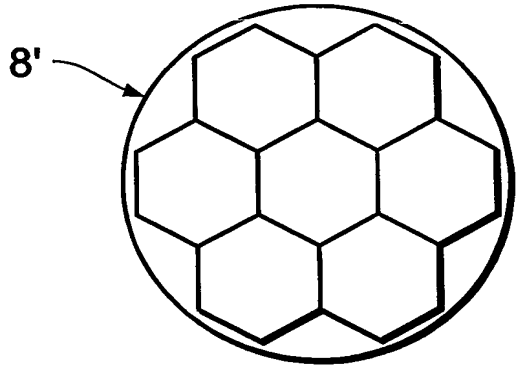


FIG.25

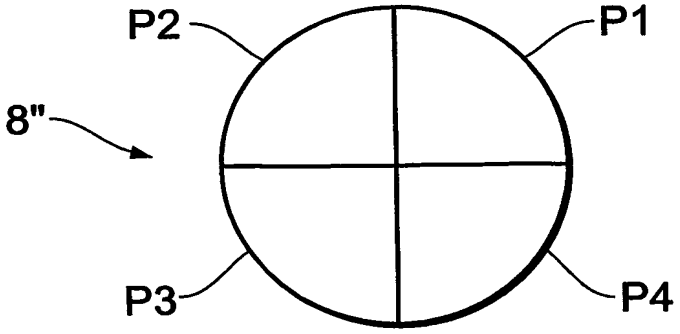


FIG.26

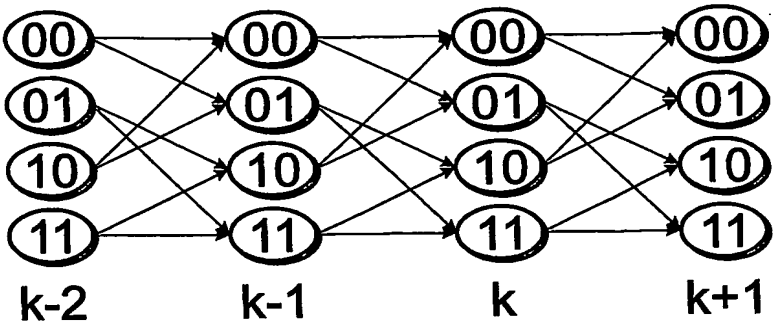


FIG.27

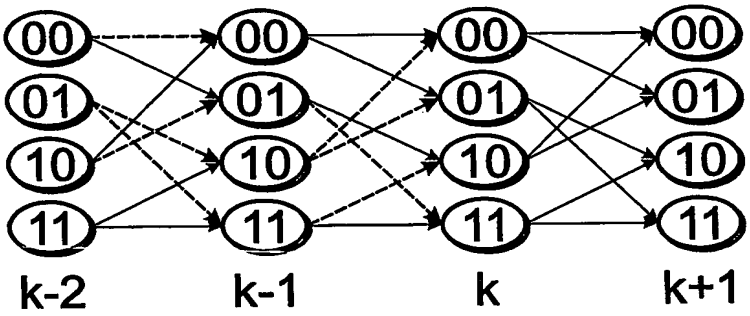


FIG.28

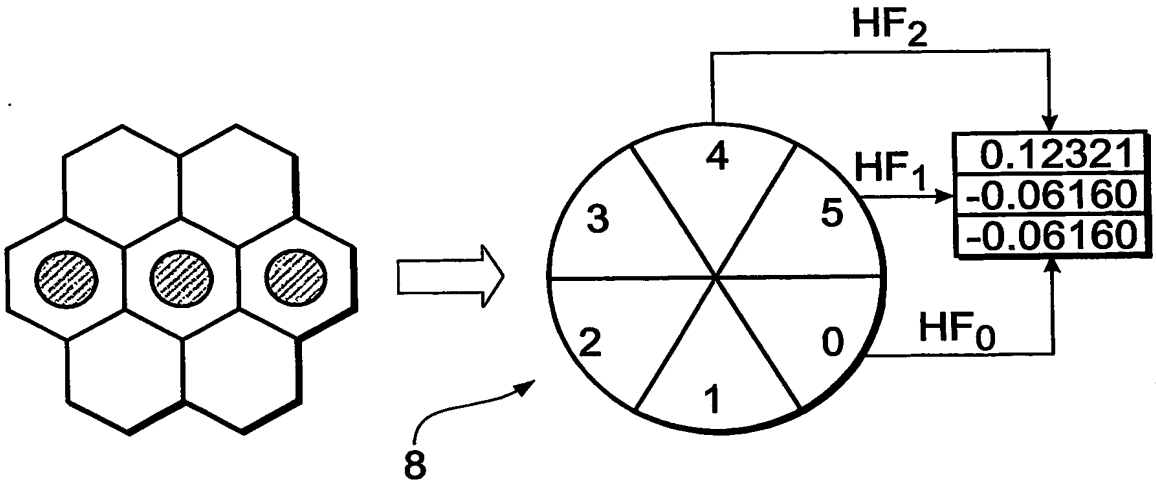


FIG.29

Class #	Central Bit	# outer bits	pattern description	# members	Vector Components 1	2	3	Threshold
000	0	0	000	1	0.00	0.00	0.00	1.00
001	0	1	001,100	6	0.10	-0.05	-0.05	0.09
002	0	2	100+1	12	0.06	0.06	-0.12	0.74
003	0	2	101	3	0.18	-0.09	-0.09	0.71
004	0	3	100+1+1	8	0.04	-0.02	-0.02	0.62
005	0	3	101+1	12	0.13	0.01	-0.14	0.59
006	0	4	101+2	6	0.05	-0.02	-0.02	0.50
007	0	4	101+1+1	6	0.09	-0.04	-0.05	0.48
008	0	4	101+101	3	0.09	0.07	-0.16	0.18
009	0	5	101+2+1	6	0.04	0.03	-0.06	0.39
010	0	6	101+2+2	1	0.00	0.00	0.00	0.30
100	1	0	010	1	0.00	0.00	0.00	0.50
101	1	1	110,011	6	0.08	-0.04	-0.04	0.40
102	1	2	110+1	12	0.05	0.04	-0.09	0.33
103	1	2	111	3	0.12	-0.06	-0.06	0.31
104	1	3	110+1+1	8	0.04	-0.02	-0.02	0.27
105	1	3	111+1	12	0.08	0.02	-0.09	0.24
106	1	4	111+2	6	0.02	-0.01	-0.01	0.20
107	1	4	111+1+1	6	0.06	-0.03	-0.03	0.18
108	1	4	111+111	3	0.05	0.05	-0.10	0.17
109	1	5	111+2+1	6	0.02	0.02	-0.03	0.14
110	1	6	111+2+2	1	0.00	0.00	0.00	0.10

FIG.30